

# Benjamin Gilbert

Earth Sciences Division  
Lawrence Berkeley National Lab  
MS 90R1116  
1 Cyclotron Road  
Berkeley CA 94720

[BGilbert@lbl.gov](mailto:BGilbert@lbl.gov)  
+1 608 358-0194 (cell)  
+1 510 486-5686 (fax)

<http://nanogeoscience.berkeley.edu>

## PERSONAL

Date of birth: April 26, 1973  
Citizenship: British  
US Permanent Resident (Green Card)

Marital status: married  
to Pupa Gilbert, née De Stasio  
Languages: English, French

## EDUCATION

Ph.D. Biophysics, July 2000. **Swiss Federal Institute of Lausanne**  
(Ecole Polytechnique Fédérale de Lausanne).  
BA Hons (Cantab) Natural Sciences (Physics) June 1994. **Cambridge University**.

## EMPLOYMENT

Geological Scientist (Career appointment)  
**Lawrence Berkeley National Lab**, Earth Sciences Division. April 2007 - present.  
Geological Scientist (Term appointment)  
**Lawrence Berkeley National Lab**, Earth Sciences Division. Oct '04 – March '07.

Postdoctoral research scholar

**University of California – Berkeley**, Department of Earth and Planetary Science. Feb 2002 - Sep 2004. Advisor: Jillian F. Banfield.

Postdoctoral research scholar

**University of Wisconsin at Madison**, Department of Physics. Aug. 2000 - Feb 2002. Advisor: Gelsomina “pupa” De Stasio.

Graduate student

**Swiss Federal Institute of Lausanne**, Department of Physics. Sep. 96-July 2000.  
Advisors: Giorgio Margaritondo and Gelsomina “pupa” De Stasio.

Scientific consultant.

**Netronics, Ltd.** (UK) to construct prototype formaldehyde sensor. Sep. 95.

Research Assistant

**Cambridge University**, Institute of Biotechnology. Oct. '94 – Oct. '95.  
Advisor: Elizabeth. A.H. Hall.

## AWARDS

Aladdin Lamp Award 1998/99 for excellence in synchrotron radiation research.

## RESEARCH FUNDING AND SUPPORT

### Nanoparticle aggregation in natural aqueous systems

B. Gilbert (PI) & C. S. Kim (Co-PI)

DOE Basic Energy Sciences (Geochemistry) 3Yr \$600K

### Imaging electronic and atomic redistribution during redox reactions at surfaces

G. A. Waychunas (PI) B. Gilbert, J. F. Banfield & R. Falcone (Co-PIs)

DOE Chemical Imaging. 2006-2009. 3Yr \$1.5M

### In-situ measurement of deposit morphology in porous media

B. Gilbert (PI) and David C. Mays, University of Colorado at Denver, Co-PI.

LBNL Program Development Grant (PDG) grant. 6 Month \$50K.

## REVIEWING FOR JOURNALS

*Geochimica et Cosmochimica Acta; Physical Review Letters; Environmental Science and Technology; Chemistry of Materials; Journal of Physical Chemistry; Journal of Nanoparticle Research; Geochemistry Transactions; Langmuir.*

## PATENTS

An organic molecule coated ferric iron oxyhydroxide nanoparticle ("CoFION") amendment for sustained biostimulation of dissimilatory iron reducing bacteria for bioremediation of contaminated environments. Submitted to the LBNL intellectual property office Aug 06.

## PUBLICATIONS

52. **B. Gilbert**, R. K. Ono, K. A. Ching and C. S. Kim.  
The effects of nanoparticle aggregation processes on aggregate structure and metal uptake.  
*J. Colloid Sci. Technol.* in press (2009).
51. **D. Spagnoli**, B. Gilbert, G. A. Waychunas and J. F. Banfield.  
Prediction of the effects of size and morphology on the structure of water around hematite nanoparticles.  
*Geochim. Cosmochim. Acta* **73**, 4023-4033 (2009). **Editor's Choice** Science May 22<sup>nd</sup> 2009.
50. **B. Gilbert**, C. Frandsen, E. Maxey and D. M. Sherman.  
Soft x-ray spectroscopy studies of the electronic structure of hematite nanoparticles  
*Physical Review B*, **79**, 035108 (2009).
49. T. Xia, M. Kovochich, M. Liong, L. Madler, **B. Gilbert**, H. Shi, J. I. Yeh, J. I. Zink & A. E. Nel.  
Comparison of the mechanism of toxicity of zinc oxide and cerium oxide nanoparticles based on dissolution and oxidative stress properties.  
*ACS Nano Letters* **2**, 2121-2134 (2008).
48. Y. Politi, R. A. Metzler, M. Abrecht, **B. Gilbert**, F. Wilt, I. Sagi, L. Addadi, S. Weiner and P.U.P.A. Gilbert  
Mechanism of transformation of amorphous calcium carbonate into calcite in the sea urchin larval spicule.  
*Proc. Nat. Acad. Sci.* **105**, 17362 (2008).
47. J. J. Erbs, **B. Gilbert** and R. L. Penn.  
Influence of size on reductive dissolution of six-line ferrihydrite  
*Journal of Physical Chemistry B*, **112**, 12127-12133 (2008).
46. J. Cervini-Silva, **B. Gilbert**, S. Fakra, S. Freidlich and J. F. Banfield.  
Decarboxylation and polymerization of catechol and formation of CeO<sub>2</sub> due to coupled redox

- and dissolution reactions at the surface of cerium(III) phosphate  
*Geochim. et Cosmochim. Acta* **72**, 2454-2464 (2008).
45. **B. Gilbert**  
Finite size effects on the real-space pair distribution function of nanoparticles  
*Journal of Applied Crystallography* **41**, 554-562 (2008).
44. C. Goodell, **B. Gilbert**, S. Weigand, H. Zhang and J. F. Banfield  
The kinetics of the water adsorption driven structural transformation of ZnS nanoparticles  
*Journal of Physical Chemistry C* **112**, 4791-4796 (2008).
43. J. W. Moreau, P. K. Weber, M. C. Martin, **B. Gilbert**, I. D. Hutcheon and J. F. Banfield  
Extracellular proteins limit the dispersal of biogenic nanoparticles  
*Science* **316**, 1600-1603 (2007). LBNL#-62685
42. **B. Gilbert**, G. Lu and C. S. Kim.  
Stable cluster formation in aqueous suspensions of iron oxyhydroxide nanoparticles.  
*Journal of Colloid and Interface Science* **313**, 152-159 (2007). LBNL#-60208
41. **B. Gilbert**, C. S. Kim, C.-L. Dong, J. Guo, P. S. Nico and D. K. Shuh  
Oxygen K-edge emission and absorption spectroscopy of iron oxyhydroxide nanoparticles.  
*X-ray Absorption Fine Structure-XAFS 13. Edited by B. Hedman and P. Pianetta, American Institute of Physics Conference Proceedings, Volume 882, X-RAY ABSORPTION FINE STRUCTURE - XAFS13: 13th International Conference, Stanford, California (USA), 9-14 July 2006, p. 51-55 (2007)*. LBNL#-62225
40. B. Chen, **B. Gilbert**, H. Zhang and J. F. Banfield.  
Mechanism of inhibition of nanoparticle growth and phase transformation by surface impurities.  
*Physical Review Letters*, **98**, 106103 (2007). LBNL#-63060
39. **B. Gilbert**, H. Zhang, B. Chen, M. Kunz, F. Huang, and J. F. Banfield.  
The compressibility of zinc sulfide nanoparticles  
*Physical Review B*, **74**, 115405 (2006). LBNL#-59574
38. Z. Lin, **B. Gilbert**, Q. Liu, F. Huang.  
A thermodynamically stable nanophase material.  
*Journal of the American Chemical Society*, **128**, 6126-6131 (2006). LBNL#-60742
37. **B. Gilbert**, F. Huang, Z. Lin, C. Goodell, H. Zhang, and J. F. Banfield  
Surface chemistry controls crystallinity of ZnS nanoparticles  
*Nanoletters*, **6**, 605-610 (2006). LBNL#-59040
36. H. Zhang, B. Chen, **B. Gilbert**, and J.F. Banfield.  
Kinetically controlled formation of a novel nanoparticulate ZnS with mixed *cubic* and *hexagonal* stacking  
*J. Mater. Chem.*, **16**, 249-254 (2006). LBNL#-63061
35. **B. Gilbert** and J. F. Banfield.  
Molecular-scale processes involving nanoparticulate minerals in biogeochemical systems  
*Reviews in Mineralogy and Geochemistry*, **59**, 109-155 (2005). LBNL#-59021
34. Gelsomina De Stasio, et al.  
Are gadolinium contrast agents suitable for gadolinium neutron capture therapy?  
*Neurological Research*, **27**, 387-398 (2005).
33. **B. Gilbert**, F. Huang, H. Zhang, G. A. Waychunas and J.F. Banfield.  
Nanoparticles: Strained and Stiff.  
*Science*, **305**, 651-654 (2004).
32. **B. Gilbert**, F. Huang, H. Zhang, Y. Ren, D. Haskel, J. C. Lang, G. Srajer, Astrid Jürgenssen, Glenn Waychunas and J. F. Banfield.

- Analysis and simulation of a nanoparticle structures observed in a surface-driven transition.  
*Journal of Chemical Physics*, 120, 11785 (2004).
31. F. Huang, **B. Gilbert**, H. Zhang and J. F Banfield.  
Reversible, surface-controlled structure transformation in nanoparticles induced by aggregation-disaggregation.  
*Physical Review Letters*, 92, 155501, 2004.
30. H. Zhang, F. Huang, **B. Gilbert**, and J. F. Banfield.  
Molecular dynamics simulations, thermodynamic analysis and experimental study of phase stability of zinc sulfide nanoparticles.  
*Journal of Physical Chemistry B*, 107, 13051 -13060, 2003.
29. **B. Gilbert**, H. Zhang, F. Huang, M. P. Finnegan, G. A. Waychunas, and J. F. Banfield.  
Special phase transformation and crystal growth pathways observed in nanoparticles  
*Geochemical Transactions*, 4, 20-27, 2003.
28. Hengzhong Zhang\*, **Benjamin Gilbert\***, Feng Huang, Jillian F. Banfield.  
\* these authors contributed equally.  
Water-driven transformation of nanoparticle structure at room temperature.  
*Nature*, 424, 1025-1029, 2003.
27. B. H. Frazer, **B. Gilbert**, B. R. Sonderegger and G. De Stasio.  
The probing depth of total electron yield in the sub keV range: TEY-XAS and X-PEEM.  
*Surface Science*, 537, 161-167, 2003.
26. G. De Stasio, B. H. Frazer, **B. Gilbert**, K. L. Richter and J. W. Valley.  
Compensation of charging in X-PEEM: a successful test on mineral inclusions in 4.4 Ga old zircon.  
*Ultramicroscopy*, 98, 57-62 , 2003.
25. **B. Gilbert**, B.H. Frazer, A. Belz, P. Conrad, K. Nealson, D. Haskel, J.C. Lang, G. Srager and G. De Stasio.  
Multiple scattering calculations of bonding and X-ray absorption spectroscopy of manganese oxides.  
*Journal of Physical Chemistry A*, 107, 2839-2847, 2003 .
24. **B. Gilbert**, B. H. Frazer, F. Naab, J. Fournelled, J.W. Valley and G. De Stasio.  
X-ray absorption spectroscopy of silicates for *in situ*, sub-micrometer mineral identification.  
*American Mineralogist*, 88, 763–769, 2003.
23. K. Masenelli-Varlota, M. Kasrai, G.M. Bancroft, G. De Stasio, **B. Gilbert**, E.S. Yamaguchi and P.R. Ryason.  
Spatial distribution of the chemical species generated under rubbing from ZDDP and dispersed potassium triborate.  
*Tribology Letters* 14, 157-166, 2003.
22. **B. Gilbert**, B. H. Frazer, H. Zhang, F. Huang, J. F. Banfield, D. Haskel, J. C. Lang, G. Srager and G. De Stasio.  
X-ray absorption spectroscopy of the cubic and hexagonal polytypes of zinc sulfide.  
*Physical Review B* 66, 245205, 2002.
21. B.H. Frazer, B.R. Sonderegger, **B. Gilbert**, K.L. Richter, C. Salt, L. Wiese, D. Rajeshf, S.P. Howard, J.F. Fowler, M. P. Mehta and G. De Stasio.  
Mapping of Physiological and Trace elements with X-PEEM.  
*Journal de Physique IV*, in press.
20. B.H. Frazer, **B. Gilbert**, and G. De Stasio.  
X-ray absorption microscopy of aqueous samples.  
*Rev.Sci. Instrum.* 73, 1373, 2002.
19. G. De Stasio, P. Casalbore, R. Pallini, **B. Gilbert**, F. Sanita, M.T. Ciotti, G. Rosi, A. Festinesi,

- L.M. Larocca, A. Rinelli, D. Perret, D.W. Mogk, P. Perfetti, M.P. Mehta and D. Mercanti.  
Gadolinium in human glioblastoma cells for gadolinium neutron capture therapy.  
*Cancer Research* 61, 4272-4277, 2001.
18. M. Labrenz, G.K. Druschel, T. Thomsen-Ebert, **B. Gilbert**, S.A. Welch, K.M. Kemner, G.A. Logan, R.E. Summons, G. De Stasio, P.L. Bond, B. Lai, S.D. Kelly, and J.F. Banfield.  
Sphalerite (ZnS) deposits forming in natural biofilms of sulfate-reducing bacteria.  
*Science* 290, 1744-1747 2000 .
17. G. De Stasio, **B. Gilbert**, B.H. Frazer, K.H. Nealson, P.G. Conrad, V. Livi, M. Labrenz and J.F. Banfield.  
The multidisciplinarity of spectromicroscopy: from geomicrobiology to archaeology.  
*J. Elec. Spec. Rel. Phenom.* 114 997-1003, 2001.
16. **B. Gilbert**, G. Margaritondo, S. Douglas, K.H. Nealson, R.F. Egerton, G. Rempfer and G. De Stasio.  
X-ray microspectroscopy of biominerals with photoconductive charge compensation.  
*J. Elec. Spec. Rel. Phenom.* 114 1005-1011, 2001.
15. **B. Gilbert**, G. Margaritondo, D. Mercanti, P. Casalbore and G. De Stasio.  
Synchrotron spectromicroscopy in medicine and biology.  
*J. Alloys and Compounds* 328, 8-13 2001.
14. **B. Gilbert**, L. Perfetti, R. Hansen, D. Mercanti, M. T. Ciotti, P. Casalbore, R. Andres, P. Perfetti, G. Margaritondo and Gelsomina De Stasio.  
UV/Ozone ashing for spatially resolved trace element analysis.  
*Frontiers in Bioscience* 5, 10-17, 2000.
13. **B. Gilbert**, M. Neumann, S. Steen, D. Gabel, R. Andres, P. Perfetti, G. Margaritondo and Gelsomina De Stasio.  
Immunohistochemistry for the MEPHISTO X-PEEM.  
*Proceedings of X-Ray Microscopy and Microanalysis XRM99*, Berkeley, CA, August 2-6, 1999.
12. **B. Gilbert**, R. Andres, P. Perfetti, G. Margaritondo, G. Rempfer and Gelsomina De Stasio.  
Charging Phenomena in PEEM imaging and spectroscopy.  
*Ultramicroscopy* 83, 129-139, 2000.
11. G. De Stasio, **B. Gilbert**, T. Nelson, R. Hansen, J. Wallace, D. Mercanti, M. Capozi, P. A. Baudat, P. Perfetti, G. Margaritondo and B. P. Tonner.  
Transmission spectromicroscopy in the water window: a feasibility test with the MEPHISTO system.  
*Rev. Sci. Instrum.* 71, 11-14, 2000.
10. **B. Gilbert**, L. Perfetti, O. Fauchoux, J. Redondo, P.-A. Baudat, R. Andres, M. Neumann, S. Steen, D. Gabel, Delio Mercanti, M. Teresa Ciotti, P. Perfetti, G. Margaritondo, and Gelsomina De Stasio.  
The spectromicroscopy of boron in human glioblastomas following administration of BSH.  
*Phys. Rev. E* 62, 1110-1118, 2000.
9. J. N. Cutler, J. H. Sanders, P. J. John, G. De Stasio, **B. Gilbert** and K. Tan.  
Chemical characterization of antiwear films generated by tris-[p-(perfluoroalkylether)phenyl] phosphine using x-ray absorption spectroscopy.  
*Wear* 236, 165-178, 1999.
8. G. W. Canning, M. L. Suominen Fuller, G. M. Bancroft, M. Kasrai, J.N. Cutler, G. De Stasio and **B. Gilbert**.  
Spectromicroscopy of tribological films from engine oil additives: Part I: Films from ZDDP's.  
*Tribology Letters* 6, 159-169, 1999.
7. D. N. McIlroy, Daqing Zhang, Robert M. Cohen, J. Wharton, Yongjun Geng, M. Grant Norton, Gelsomina De Stasio, **B. Gilbert**, Luca Perfetti, J. H. Streiff, B. Broocks and Jeanne L. McHale.

- Electronic and dynamic studies of boron carbide nanowires.  
*Phys. Rev. B.* 60, 4874-4879, 1999.
6. G. De Stasio, L. Perfetti, **B. Gilbert**, O. Fauchoux, M. Capozi, P. Perfetti, G. Margaritondo and B. P. Tonner.  
The MEPHISTO spectromicroscope reaches 20 nm lateral resolution.  
*Rev. Sci. Instrum.* 70, 1740-1742, 1999.
5. G. De Stasio, **B. Gilbert**, L. Perfetti, R. Hansen, D. Mercanti, M. T. Ciotti, R. Andres, V. E. White, P. Perfetti and G. Margaritondo.  
Cell ashing for trace element analysis: a new approach based on UV/Ozone.  
*Anal. Biochem.* 266, 174-180, 1999.
4. G. De Stasio, **B. Gilbert**, L. Perfetti, T. Nelson, M. Capozi, P. A. Baudat, F. Cerrina, P. Perfetti, B. P. Tonner and G. Margaritondo.  
Soft-X-ray transmission photoelectron spectromicroscopy with the MEPHISTO system.  
*Rev. Sci. Instrum.* 69, 3106-3108, 1998.
3. G. F. Lorusso, G. De Stasio, **B. Gilbert**, D. Perret, P. Perfetti, G. Margaritondo, P. Casalbore, M. T. Ciotti, L. Milazzo and D. Mercanti.  
High sensitivity quantitative analysis of cobalt uptake in rat cerebellar granule cells with and without excitatory amino acids.  
*Neuroscience Letters* 248, 9-12, 1998.
2. **B. Gilbert**, J. Redondo, P-A. Baudat, G. F. Lorusso, R. Andres, E. G. Van Meir, M-F. Hamou, T. Suda, D. Mercanti, M. T. Ciotti, T. C. Droubay, B. P. Tonner, P. Perfetti, G. Margaritondo and G. De Stasio.  
Spectromicroscopy of boron for the optimization of boron neutron capture therapy (BNCT) for cancer.  
*J. Phys. D.* 31, 2642-2647, 1998.
1. G. De Stasio, **B. Gilbert**, R. Andres, G. F. Lorusso, J. Redondo, E. G. Van Meir, J.-F. Brunet, T. C. Droubay, B. P. Tonner, D. Mercanti, M. T. Ciotti, T. Suda, P. Perfetti and G. Margaritondo.  
Synchrotron spectromicroscopy for microchemical analysis of boron in rat brain tumor treated with BSH.  
in "Advances in Neutron Capture Therapy", B. Larsson, J. Crawford And R. Weinreich Eds., Elsevier, Amsterdam, 321-325, 1997.

### **Articles submitted and in preparation**

53. Nel et al.  
High-Content Nanotoxicity Screening and Evaluation of Iron Doped Zinc-oxide Nanomaterial – A Strategy for Safer Nanotechnology Applications  
Submitted to *Nature Materials*.

### **INVITED PRESENTATIONS AT INTERNATIONAL CONFERENCES**

10. American Chemical Society Colloids and Interfaces.  
*The stability and structure of aqueous clusters of ferrihydrite nanoparticles*  
New York, June 12, 2009.
9. Materials Research Society Spring Meeting.  
*The Crystal Chemistry of Ferrihydrite*.  
San Francisco, April 15, 2009.
8. American Geophysical Union Fall Meeting.  
*From Crystal Chemistry to Colloid Stability*.

San Francisco, December 15, 2008.

7. Society of Environmental Toxicology and Chemistry (SETAC) 28<sup>th</sup> Annual Meeting.  
*The geochemistry of ferric iron oxyhydroxide nanoparticles: A model for the fate and transport of nanomaterials in the environment*  
Milwaukee, November 11-15, 2007.
6. California Nanosystems Institute (CNSI) 3rd Annual Frontiers in Nanosystems  
*Nanogeoscience: Material Science Lessons from Natural Nanoparticles*  
Kauai, March 19-21, 2007.
5. American Chemical Society Fall Meeting  
*Interfacial interactions drive structure transformations in zinc sulfide nanoparticles*  
San Francisco, September 11-14, 2006.
4. 19<sup>th</sup> General Meeting of the International Mineralogical Association  
*Nanoparticles in the Earth Sciences: Making the link between size dependent properties and reactivity (Keynote)*  
Kobe, Japan, July 23-38, 2006.
3. 88th Canadian Chemistry Conference and Exhibition (CSC 2005).  
*Small- and wide-angle x-ray scattering studies of nanoparticles and their aggregates.*  
Saskatoon, Canada, July 2005.
2. American Geophysical Union (AGU) Spring Meeting, 2005  
*The colloid behavior of nanoparticles in aqueous environments.*  
New Orleans, Louisiana, May 26-1, 2005.
1. American Chemical Society meeting.  
*Special growth and transformation pathways in nanoparticles.*  
New Orleans, LA, March 27, 2003.

## DEPARTMENTAL SEMINARS AND COLLOQUIA

4. Departmental Seminar, Earth & Planetary Sciences, UC-Berkeley.  
*Addressing the nanoparticle challenge to mineralogy and geochemistry.*  
Berkeley, CA, January 22, 2009.
3. Geosciences Seminar, Virginia Tech.  
*Progress in understanding the geochemical reactivity of ferric iron (oxyhydr)oxide nanoparticles.*  
Blacksburg, VA, September 7, 2008.
2. Chapman University Natural Sciences Seminar  
*Size effects on the geochemistry of ferric iron oxide and oxyhydroxide nanoparticles*  
Orange, CA, December 4, 2006.
1. R. W. Herb Material Physics Seminar.  
*Nanoparticles as dynamic systems.*  
UW-Madison, WI, February 1, 2005.

## INVITED PRESENTATIONS AT WORKSHOPS AND SYNCHROTRON USERS MEETINGS

12. Synchrotron in the Environmental Sciences (SES-IV) Workshop.  
*Synchrotron Methods for Studying Nanostructure in Environmental Materials*  
San Francisco, December 12, 2008.
11. Workshop on Photon In-Photon Out Spectroscopy at the ALS User's Meeting.  
*X-ray spectroscopy and aqueous photochemistry of iron oxide nanoparticles*  
Berkeley, October 5, 2007.

10. Workshop on the Bio-physicochemical Interactions of Nanomaterials  
*Aspects of Nanoparticle Stability, Reactivity and Toxicity: Insights from the Environment*  
UCLA, September 9-11, 2007.
9. X-ray Absorption Fine Structure XAFS 13  
*X-ray absorption and emission studies of environmental nanoparticles*  
Stanford University, Palo Alto, CA, July 9-14, 2006.
8. Mineralogical Society of America (MSA) Short Course on Molecular Geomicrobiology  
*Molecular-scale processes involving nanoparticulate minerals in biogeochemical systems.*  
Berkeley, CA, December 4, 2005.
7. Stanford Synchrotron Radiation Laboratory Workshop on Small-Angle X-Ray Scattering.  
*Nanoparticle clusters: An introduction to small-angle x-ray scattering.*  
Palo Alto, CA, Oct 19, 2005.
6. User's Meeting of the UW-SRC. Tutorial presentation.  
*X-ray Spectromicroscopy of Biological Specimens: Principles and Opportunities.*  
SRC, Madison, WI, October 26, 2000.
5. NIRT Workshop in the Structure of Nanoparticles.  
*X-ray scattering observations of structural modifications in zinc sulfide nanoparticles.*  
Tempe, AZ, December 6-8, 2004.
4. SSRL Users meeting.  
*Small angle scattering from nanoparticles.*  
Stanford, Palo Alto, CA, October 16, 2004.
3. SSRL Users meeting.  
*Investigations into the Surface Structure and Chemistry of ZnS Nanoparticles.*  
Stanford, Palo Alto, CA, October 10, 2003.
2. *Synchrotron spectromicroscopy in Medicine and Biology.*  
Polish Synchrotron Society's 5<sup>th</sup> International School and Symposium on Synchrotron Radiation.  
Ustron-Jaszowiec, Poland. June 12-17, 2000.
1. *MEPHISTO Spectromicroscopy of Human Glioblastoma for Neutron Capture Therapy.*  
International Workshop on Spectromicroscopy.  
SRC, Madison, WI, October 23-25, 1998.

## CONTRIBUTED PRESENTATIONS AT INTERNATIONAL CONFERENCES

12. G. Lu & **B. Gilbert**. *Lattice Boltzmann Simulation of Diffusion and Sorption in Nanoparticle Aggregates.* (Oral) Computational Methods in Water Resources, San Francisco, July 7, 2008.
11. **B. Gilbert**. *Surface and electronic structure effects on interfacial charge transfer at iron oxide nanoparticle surfaces.* (Oral) Goldschmidt Conference, Cologne, August 23, 2007.
10. **B. Gilbert**. *Arrested aggregation: Nanocluster formation by iron oxyhydroxide nanoparticles.* (Oral) ACS Colloids & Surfaces, Boulder, CO, June 18, 2006.
9. **B. Gilbert**. *The impact of aqueous colloid properties on the transport of metal oxide and sulfide nanoparticles.* (Oral) Society of Environmental Toxicology and Chemistry (SETAC) 26th Annual Meeting, Baltimore, November 16, 2005.
8. **B. Gilbert**, F. Huang, H. Zhang and J.F. Banfield. *Reversible, surface-controlled structure transformation in nanoparticles induced by aggregation state.* (Oral) Materials Research Society Spring Meeting, San Francisco, April 14, 2004.
7. **B. Gilbert**, F. Huang, H. Zhang and J.F. Banfield. *Measurements of the Internal Strain and*

*Structural Dynamics of ZnS nanoparticles.* (Poster) Materials Research Society Spring Meeting, San Francisco, April 13, 2004.

6. **B. Gilbert**, F. Huang, H. Zhang and J.F. Banfield. *Surface modification of lattice dynamics in ZnS nanoparticles.* (Oral) American Geophysical Union Fall Meeting, San Francisco, December 8, 2003.
5. **B. Gilbert**, G. De Stasio, R. Andres, M. Neuman and D. Gabel. *The Chemical State of BSH following Administration to Patients with Glioblastoma Multiforme.* (Oral) 9<sup>th</sup> International Symposium on Neutron Capture Therapy, Osaka, Japan, 206 October 2-6, 2000.
4. **B.Gilbert**, G. Margaritondo, S. Douglas, K.H. Nealson, R.F. Egerton, G. Rempfer, G. De Stasio. *X-ray microspectroscopy of biominerals with photoconductive charge compensation.* (Poster) 8th International Conference of Electronic spectroscopy and Structure, ICESS 8, Berkeley, CA, August 8-12, 2000.
3. **B.Gilbert**, M. Neumann, S. Steen, D. Gabel, R. Andres, P. Perfetti, G. Margaritondo and Gelsomina De Stasio. *Immunohistochemistry for the MEPHISTO X-PEEM.* (Poster) X-ray Microscopy and Microanalysis XRM99, Berkeley, CA, August 2-6, 1999.
2. B.Gilbert, R. Andres, P. Perfetti, G. Margaritondo, and Gelsomina De Stasio. *Movie Acquisition with MEPHISTO X-PEEM for Microchemical Analysis: First Successful Tests.* (Poster) X-ray Microscopy and Microanalysis XRM99, Berkeley, CA, August 2-6, 1999.
1. **B.Gilbert**, R. Andres, P. Perfetti, G. Margaritondo, and Gelsomina De Stasio. *Elemental Mapping in Biological and Materials Science Specimens with Imaging Synchrotron Spectromicroscopy.* (Oral) 2<sup>nd</sup> Int. SLS Workshop on Synchrotron Radiation, Brunnen, Switzerland, Oct. 26-30 1999.

## **SYMPOSIUM ORGANIZATION AT INTERNATIONAL CONFERENCES**

2. C. S. Kim and **B. Gilbert**.  
*Nanoscale Size Effects on Geochemical Processes: Reactivity, Kinetics, and Pathways*  
13<sup>th</sup> Annual V. M. Goldschmidt conference, Melbourne, Australia, August 28, 2006.
1. **B. Gilbert** and J.F. Bargar.  
*The Structure and Reactivity of Nanoparticles in the Environment*  
American Chemical Society Fall Meeting, San Francisco, Sep. 13 & 14, 2006.